Deseret Chemical Depot
Attachment 6
General Facility Description

General Facility Description [R315-3-2.5, R315-8-2.9]

1.0 General Description [R315-3-2.5(b)(1)]

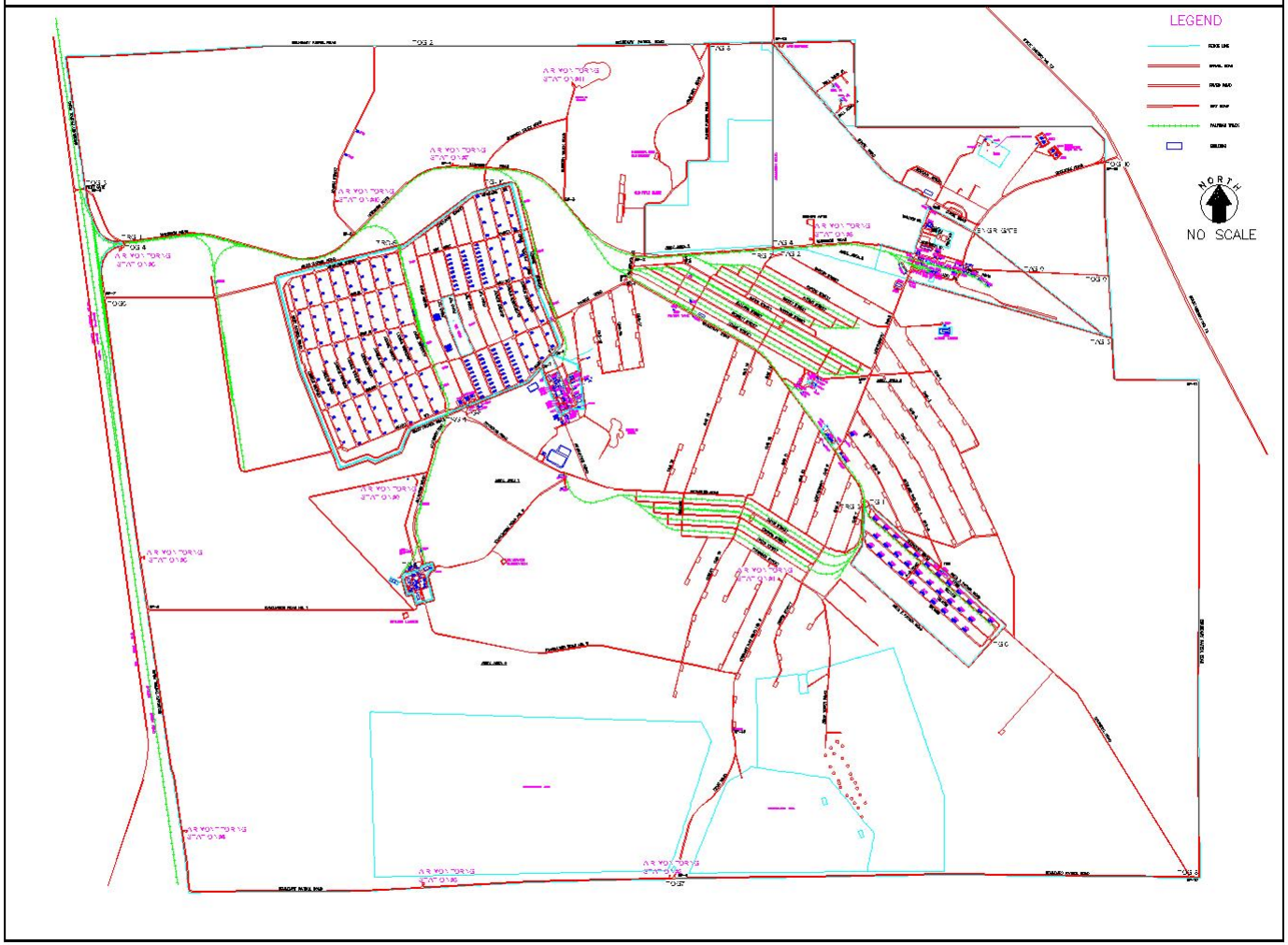
1.1 Tooele Army Depot (TEAD), located immediately west of Tooele City, at one time included two installations, the TEAD North and South Areas. The TEAD North Area, adjacent to Tooele City, was originally known as the Tooele Ordnance Depot (TOD), and functioned as a storage depot for World War II supplies, ammunition, and combat vehicles. In 1949, TOD assumed command of the South Area. In 1962, following a transfer to a new command, the TOD was redesignated the TEAD. Since then, the South Area has been realigned under the U.S. Army Chemical and Biological Defense Command (now the US Army Chemical Materials Agency [CMA]) and redesignated the Deseret Chemical Depot (DCD).

1.2 The primary mission of DCD is the storage and demilitarization of chemical warfare agents. This permit application is specifically for the storage of waste chemical munitions, bulk items, and other hazardous wastes at DCD. Two onsite disposal facilities, the Tooele Chemical Agent Disposal Facility (TOCDF) and the Chemical Agent Munitions Disposal System (CAMDS), are located within DCD and are addressed under separate permits. The general types of hazardous wastes stored at DCD are:

1.2.1 Waste munitions containing mustard or VX agent, including explosive and chemical agent components;
1.2.2 Overpacked leaker munitions;
1.2.3 Activated carbon from air filtration systems;
1.2.4 Secondary agent-related waste streams including decontamination solutions;
1.2.5 Laboratory wastes, contaminated personal protective equipment (PPE), and tools and materials from leaker-mitigation activities;
1.2.6 Waste piles of discarded igloo doors;
1.2.7 Non-agent-related waste from maintenance and industrial activities such as batteries, engine coolant, waste oil, paints, and solvents; and
1.2.8 Wastes in Solid Waste Management Units (SWMUs).

1.3 DCD is located approximately 12 miles south of Tooele City in Tooele County, Utah. Figure 6-1, Deseret Chemical Depot-General Site Topographic Map, shows the general layout of DCD, including permitted storage facilities, topographic contours, and other physical site characteristics. Storm drainage features are shown on Figure 6-2, Deseret Chemical Depot-Storm Drainage Map, and SWMU locations are shown in Figure 6-3, Deseret Chemical Depot-SWMU Location Map. The following is a general description of the processes that generate hazardous waste at DCD.

DESERET CHEMICAL DEPOT SITE MAP



2.0 Chemical Operations

2.1 Chemical munition and bulk item storage and maintenance operations occasionally involve chemical agent decontamination of PPE, munitions, and storage materials. Waste decontamination solution is generated from the decontamination of equipment and neutralization of chemical agents.

3.0 Vehicle and Equipment Maintenance

3.1 Vehicle and equipment maintenance shops are operated to repair and maintain the equipment necessary to support DCD's mission. Wastes generated from these operations include waste battery acid, used brake fluid, used engine coolant, and lubricants or other petroleum products that may be contaminated with solvents or heavy metals.

4.0 Environmental Restoration and Decontamination Operations

4.1 DCD has ongoing environmental restoration projects. These projects include monitoring well installation and Resource Conservation and Recovery Act (RCRA) corrective actions that generate investigative wastes (e.g., drill cuttings, used PPE, purge water). Environmental restoration activities bring equipment and vehicles into contact with contaminated media such as soil and groundwater. Equipment and vehicles used for these projects must be decontaminated, generating waste decontamination solutions. Investigative wastes and waste decontamination solutions are contained, labeled, and disposed of according to applicable state and federal regulations.

5.0 Miscellaneous Operations

5.1 A variety of other operations generate small quantities of hazardous wastes, including paints, adhesives, solvents, and spent filters from used gas masks. Additional items may occasionally be generated. In these instances, DCD will either submit a permit modification to add such items to their permit, or the items will be stored in an onsite storage area and properly disposed of.

5.2 SWMUs are areas in which solid and hazardous wastes may have been placed or released. A number of SWMUs have been identified at DCD during the RCRA Facility Assessment and subsequent field investigations at DCD.

6.0 Overview of the Storage Process

6.1 Hazardous wastes managed at DCD can be divided into two categories: agent-related wastes and non-agent-related wastes.

6.2 Agent-related wastes include waste chemical munitions, waste bulk items, and agent-contaminated materials, such as decontamination solutions. Waste munitions, waste bulk items, and agent-related wastes are managed in accordance with the Utah Solid and Hazardous Waste Act (USHWA) and RCRA.

6.3 Permitted storage areas store agent-related waste and non-agent-related waste. Chemical agent is contained in munitions such as M55 rockets, 105mm and 155mm howitzer shells, M23 mines, spray tanks, and 4.2-inch mortar rounds. Bulk chemical agent is stored in ton containers.

General descriptions of the munitions are provided in Attachment 1 (Waste Analysis Plan). In accordance with R315-2-11(e)(1), munitions and bulk items are managed as hazardous waste if they are found to be leaking, are derived from waste, or are designated as waste by the Army Designated Disposition Authority (DDA). All other chemical munitions and bulk items are managed as product. Waste chemical munitions, waste bulk items, and agent-related hazardous wastes are stored in permitted storage facilities.

6.4 Table 1-1-2, Hazardous Waste Streams and Storage Facilities, provides a table of hazardous wastes stored at DCD hazardous waste management units, their associated Environmental Protection Agency (EPA) waste codes, and a brief discussion about the hazardous wastes. More detailed descriptions of the DCD hazardous waste management units appear in Attachments 12 (Container Management), 13 (Management of Waste Piles), with detailed descriptions of primary containers in Attachment 12 (Container Management).

7.0 Agent-Related Hazardous Waste Generated and Stored

7.1 The Utah Department of Environmental Quality Division of Solid and Hazardous Waste (UDSHW) lists waste chemical agents and agent-related secondary wastes and residues as acutely hazardous wastes as defined in R315-2-11(e)(1). Neat waste agents of all types are assigned a waste code of P999. Agent-related secondary wastes and residues from all types of agent are identified by waste code F999.

8.0 Chemical Agents, Munitions, and Bulk Items

8.1 Chemical munitions and bulk items stored at DCD become wastes under the following specific circumstances:

8.1.1 The munition is leaking, deteriorated, or otherwise beyond repair (overpacked);
8.1.2 The munition is removed from storage for the purpose of treatment or destruction; or
8.1.3 The munition is designated as waste by the Army DDA.

8.2 Agent Characteristics

8.2.1 *G agents* are rapid-acting fluorinated organophosphorous nerve agents that work by inactivating the body's cholinesterase. The primary hazard from G agent is vapor absorption through the respiratory tract, although it can be absorbed through any part of the skin, eyes, or mucous membranes by contact, and the gastrointestinal tract by ingestion. When dispersed as large droplets, G agent is moderately persistent; it is nonpersistent when disseminated as a cloud of very fine particles.

8.2.2 *VX* is a rapid-acting sulfonated organophosphorous nerve agent that inactivates cholinesterase. Because VX does not evaporate quickly, the primary VX hazard is liquid absorption through the skin. However, VX can be absorbed through the respiratory tract as a vapor or aerosol and through the gastrointestinal tract by ingestion. VX is generally more persistent than G agents.

8.2.3 *Blister agents* (H, HD, and L) are persistent chlorinated sulfur agents that act on the eyes, lungs, and skin to burn and blister the skin or any other part of the body they contact. Blister agents cause intense inflammation and severe blistering of both skin and mucous membranes by contact with both liquid and vapor forms of the agent. H, HD, and L agents are only moderately volatile and are known carcinogens.

8.3 Agent-Related Wastes

8.3.1 Wastes contaminated with agent are stored in onsite storage areas. Wastes may include metal parts, energetic components, dunnage, used PPE, charcoal, and other absorbents and filters. Storage requirements and configurations are discussed in Attachments 12 (Container Management) and 13 (Management of Waste Piles).

8.4 Non-Agent-Related Hazardous Wastes Generated and Stored

8.4.1.1 Non-agent-related hazardous wastes are generated at DCD during the performance of remediation activities and industrial support activities such as building and motor vehicle maintenance, small construction projects, and office operations. Non-agent-related hazardous wastes are segregated in containers by compatibility, and are transported to and stored at onsite storage facilities before being transferred to an approved offsite Treatment, Storage, and Disposal Facility (TSDF). Alternatively, they are transported to and stored at an RCRA-permitted hazardous waste storage unit to await transfer to an approved offsite TSDF by the Defense Reutilization and Marketing Office (DRMO).

8.4.2 DRMO disposes of excess property received from the military services mainly through reutilization, transfer, donation, and sales. DRMO provides hazardous waste disposal services for DCD. DRMO administers contracts with the TSDFs in accordance with RCRA and USHWA requirements.

8.5 Propellant and Explosive Characteristics of Energetic Components of Chemical Munitions

8.5.1 The physical characteristics and chemical compositions of the major explosive and propellant constituents of chemical agent munitions stored at DCD are summarized in the Attachment 1 (Waste Analysis Plan).

9.0 **Topographic Map** [R315-3-2.5(b)(19)]

9.1 Figure 6-1, General Site Topographic Map, shows permitted facilities, loading and unloading areas, surface water features, fence lines, and roads. It also depicts the primary DCD access point, the facility's legal boundaries, and area topography in accordance with the requirements of R315-3-2.5(b)(19). Figure 6-1 also details the location of DCD hazardous waste management units and the surrounding area.

10.0 **Water-Related Features**

10.1 DCD is located in the Rush Valley, a basin located in the basin and range region of the western United States. The topography of the drainage basin is generally smooth and uniform, sloping to the southwest from the facility to the Rush Valley floor. The valley floor drains northwest to Rush Lake, approximately 11 miles from the facility. Few well-defined natural drainage channels exist in the DCD vicinity. The soils are permeable and can easily absorb the 100-year precipitation event, expected to be about 3.2 inches. Ponding or pooling of runoff waters does not generally occur. The Great Salt Lake, located approximately 75 miles from DCD, is about 850 feet lower in elevation than the Depot.

11.0 **Surrounding Land Uses**

11.1 The installation is surrounded mostly by federally owned land, administered by the Bureau of Land Management, some State of Utah owned land and some privately owned land. There are no injection or withdrawal wells within the boundaries of the container storage facilities.

12.0 Wind Rose

12.1 A wind rose for the DCD facility is shown in Figure 6-4. The wind rose indicates a prevailing wind speed from the southeast greater than 5.1 mph for more than 16% of the recorded period. Wind comes from the northwest at about 1.5 to 3.1 mph for about 12% of the recorded period.

13.0 Additional Requirements for Land Disposal Facilities [R315-3-2.5(c)(3)] - Not Applicable

14.0 Regional Hydrology, Geology, Meteorology, and Land Use [R315-3-2.14(b)]

14.1 Geology

14.1.1 DCD is located in the basin and range physiographic province that extends from western Utah to California, and from southeastern Oregon to Arizona. Basin and range geology is characterized by alternating parallel zones of uplifted and down-dropped fault blocks, which are known as horsts and grabens, respectively, and typically result from a period of regional tectonic extension. Uplifted horsts form mountain ranges that surround the down-dropped basins.

14.1.2 The valley in which DCD is located, the Rush Valley, is a graben feature and is bounded by uplifted horst features of the Stansbury Range to the west and the Oquirrh Range to the east, both of which rise steeply from the valley floor. As is typical of basin and range geology, the boundary between the Rush Valley basin and adjacent mountain ranges is defined by one or more normal faults, which are indicative of the extensional forces that resulted in the current structural geology of the area. The northern terminus of the Rush Valley is defined by South Mountain, which has a much smaller vertical rise than the major ranges to the east and west, but still effectively blocks any runoff to the north. From the DCD Facility, the Rush Valley extends south for many miles.

14.1.3 The stratigraphy of the Rush Valley basin is generally composed of a series of alluvial fans interbedded with evaporite deposits. The alluvial fans are outwash features from the surrounding mountain ranges. Due to the steep gradient of the mountainsides, the alluvial fans often extend thousands of meters into the basin. Evaporite deposits consist primarily of evaporite minerals such as halite and gypsum and are a common feature in closed basins of the Western U.S. At one time, these deposits were minerals dissolved in precipitation runoff that periodically accumulates in depressions within the Rush Valley. As the accumulated water evaporates, the minerals remain to form deposits on the valley floor. With time, alluvial fans cover the deposits, resulting in the interbedded stratigraphy seen today. The soft sediments of the valley are underlain by crystalline basement rock at great depth.

14.1.4 The topography of the Rush Valley is generally flat, but with low-lying ridges, swales, and gulleys interspersed throughout the valley floor. DCD occupies a small rise on the east side of the valley. The eastern boundary of the facility is roughly one-eighth mile west of the toe of the Oquirrh Range mountain front. Across the DCD facility, the surface slopes gently downward to the west and north to the north-south trending centerline of the Rush Valley floor. The valley floor is nearly flat in the vicinity, with a slight gradient to the north toward Rush Lake and South Mountain.

14.2 Meteorology and Hydrology

14.2.1 The climate of the Rush Valley is extremely arid, with very low annual precipitation and high evapotranspiration. Refer to Figure 6-4 for a wind rose that illustrates prevailing wind directions.

14.2.2 The valley floor drains northwest to Rush Lake, which is approximately 5 miles from the facility. A few well-defined natural drainage channels exist on the eastern side of DCD. These channels are products of the erosion that results from sporadic flash flood events on the western flanks of the Oquirrh Range. The soils are permeable and can easily absorb the 100-year precipitation event, expected to be about 3.2 inches. Ponding or pooling of runoff generally does not occur at the DCD facility. Virtually all precipitation or runoff evaporates or infiltrates into the soil. A small amount of infiltrated water percolates into deep aquifer storage, although most remains in shallow groundwater systems and eventually discharges into Rush Lake at the north end of Rush Valley. The only way that water is naturally removed from Rush Valley is via evapotranspiration.

14.3 Land Use

14.3.1 DCD is a military facility operated by the US Army Chemical Materials Agency (CMA). The installation is surrounded by some state-owned land, some privately owned land, but mostly by federally owned land administered by the Bureau of Land Management.

14.4 Seismic Standard [R315-3-2.5(b)(11)(i)-(ii), R315-8-2.9(a)]

14.4.1 DCD is an existing facility and as such is exempt from compliance with seismic standards.

14.5 Floodplain Standard [R315-3-2.5(b)(11)(iii)-(iv), R315-8-2.9(b)]

14.5.1.1 No Federal Insurance Administration 100-year floodplain maps of the DCD facilities exist. Nonetheless, it has been determined that the DCD facilities are outside of the 100-year flood plain and not subject to flooding. No floods have occurred at DCD during the 45 years it has been in existence and there is no history of flooding in the area, so a 100-year flood in the vicinity of DCD would be practically insignificant. The overall drainage gradient for the entire DCD facility is 1 percent or greater. The southeastern corner of DCD, which is the lowest elevation point within the facility, is 35 to 40 feet higher in elevation than Rush Lake, which would be the accumulation point of floodwaters in the Rush Valley.

14.6 Traffic Patterns [R315-3-2.5(b)(10)]

14.6.1 Access to DCD is via State Highway 198, connecting State Highway 73 to the DCD main (north) gate; and via State Highway 73 directly, connecting to Doolittle Road and the east gate (Figure 6-1). Both State Highways are two-lane, undivided, asphalt concrete roads zoned at 55 mph. Neither highway is heavily traveled. The intersections of Highways 73 and 198 and Doolittle Road and Highway 73 are simple interchanges with no left turn lanes or traffic islands. Traffic control at the Highway 73/198 interchange is via a yield sign on Highway 198. Traffic control at the Doolittle Road /Highway 73 intersection is via a yield sign on Doolittle Road.

14.6.2 In the past, DCD's west gate has been used for munitions shipments. Presently, no traffic is allowed through the west gate and the gate is kept locked except for emergencies. State Highway

36 is a two-lane, undivided, asphalt-concrete road. The Highway 36 / Harrison Road intersection is a simple interchange with traffic control via a yield sign on Harrison Road.

14.6.3 Generally all traffic, including government vehicles, commercial carriers, and privately owned vehicles, follows the primary traffic route. Only security vehicles, conventional munitions transportation vehicles, and maintenance vehicles travel off the primary route. Conventional munitions movements are limited to transport of the munitions to the Open Burning/Open Detonation (OB/OD) grounds where the munitions are destroyed. Mostly inactive and will only be used in emergency situations.

14.7 Estimated Traffic Volume

14.7.1 Vehicle traffic on DCD property is variable, depending mostly on demilitarization activities and security exercises. Traffic on DCD roads is largely associated with other RCRA facilities.

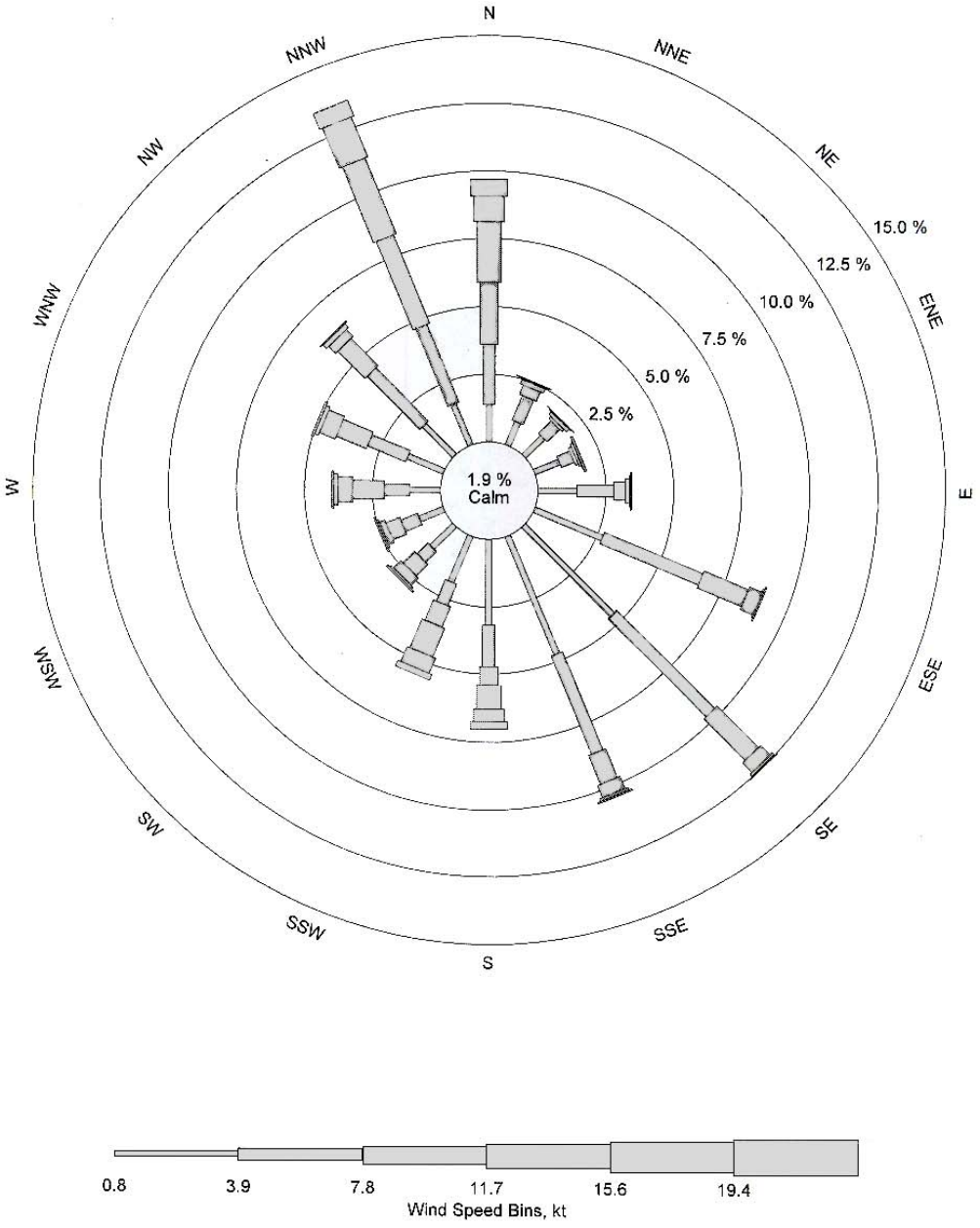
14.8 Traffic Control

14.8.1 Due to low volume of traffic at DCD, traffic control measures are simple. Speed is restricted to 30 mph unless otherwise posted, 20 mph is posted in building and office areas, and 40 mph is posted for most of the primary traffic route. All blind or hazardous turns are marked and posted at reduced speeds. Yield signs control traffic at all major intersections. All railroad grade crossings are marked with signs. Traffic control enforcement is by security personnel.

14.9 Road Surfacing and Load Bearing Capacity

14.9.1 In general, all main routes to the HW management units are asphalt/concrete bituminous. Secondary roads are gravel or earthen. All roads at DCD are designed for a maximum load-bearing capacity of 18,000 lbs per axle.

Figure 6-4: Wind Rose



Windrose: Based on DCD weather data from Tower 9 (central to installation) for period 1/101 through 12/31/01.